

Appl. No. 09/482,023
Amdt. dated July 28, 2003
Reply to Final Office Action of April 28, 2003

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1 - 9 (Previously cancelled)

10. (Previously Amended) A quench gasifier for gasifying ash-containing hydrocarbon feedstocks, comprising:

a combustion chamber for partially oxidizing carbon in the feedstocks to produce synthesis gases; and

a quench chamber adjacent to said combustion chamber, said combustion chamber including a throat adjacent to said quench chamber for directing said gases from said combustion chamber to said quench chamber, characterized in that said throat includes:

an inlet adjacent to said combustion chamber, said inlet having an inlet diameter;

an outlet adjacent to said quench chamber, said outlet having an outlet diameter;

an inner surface and outer surface between said inlet and said outlet;

an electrical heating element between said inner and outer surfaces; and

wherein said inlet diameter is greater than said outlet diameter.

11 - 14 (Previously cancelled)

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15. (Previously Amended) The quench gasifier according to claim 10 wherein said inner surface comprises a wind tunnel profile.

16. (Previously Amended) The quench gasifier according to claim 10 wherein said throat further comprises a layer of insulating refractory material between said electrical heating element and said outer surface.

17. (Previously Amended) The quench gasifier according to claim 10 wherein the ratio of said inlet diameter to said outlet diameter is at least 3.

✓ 18. (Currently Amended) The quench gasifier according to claim 17 wherein said ratio is in the range from 3 to 67.

19. (Previously Amended) The quench gasifier according to claim 10 wherein said quench chamber comprises a quench ring substantially axially adjacent to said throat outlet, such that the quench gasifier does not include a plenum chamber.

20. (Currently Amended) The quench gasifier according to claim 19 wherein said quench ring has an inner diameter that is greater than the diameter of said throat outlet, ~~said quench ring inner diameter being sufficiently large to substantially prevent damage to said quench ring.~~

*gets rid
of part
of nest
muffler
but need
to correct
entire
claim*

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21. (Previously Cancelled)

22 - 29 (Withdrawn)

30. (Previously added) The quench gasifier according to claim 17 wherein said inlet diameter gradually and continuously decreases to said outlet diameter along said inner surface.

31. (Previously added) The quench gasifier according to claim 10 wherein said heating element extends from said outlet to said inlet.

32. (Previously added) The quench gasifier according to claim 31 wherein said heating element is a spirally wound member having a first diameter near said throat inlet and a second diameter near said throat outlet, and wherein said first diameter is greater than said second diameter.

33. (Previously added) The quench gasifier according to claim 10 wherein said heating element extends from said outlet to above said inlet such that said heating element extends into a portion of said combustion chamber.

34. (Previously added) A quench gasifier for gasifying hydrocarbon feedstocks, comprising:

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a combustion chamber for partially oxidizing the carbon in the feedstocks to produce synthesis gases and slag;

a quench chamber adjacent to said combustion chamber, said quench chamber having a gas outlet for directing said gases away from said quench chamber; and

wherein said combustion chamber includes a throat for directing said gases and said slag from said combustion chamber to said quench chamber, said throat comprising:

an inlet;

an outlet;

an outer surface between said inlet and said outlet;

an inner surface between said inlet and said outlet;

a heating element between said inner and outer surfaces; and

wherein said inner surface has a curved, conical contour.

35. (Previously added) The quench gasifier according to claim 34 wherein said heating element is near said inner surface such that said heating element substantially follows said curved, conical contour of said inner surface.

36. (Previously added) The quench gasifier according to claim 34 wherein said throat inlet is adjacent to said combustion chamber, and said heating element extends beyond said inlet into a portion of said combustion chamber.

37. (New) A quench gasifier for gasifying ash-containing hydrocarbon feedstocks, comprising:

a combustion chamber for partially oxidizing carbon in the feedstocks to produce synthesis gases; and

a quench chamber adjacent to said combustion chamber, said combustion chamber including a throat adjacent to said quench chamber for directing said gases from said combustion chamber to said quench chamber, characterized in that said throat includes:

an inlet adjacent to said combustion chamber, said inlet having an inlet diameter;

an outlet adjacent to said quench chamber, said outlet having an outlet diameter;

an inner surface and outer surface between said inlet and said outlet; and

an electrical heating element between said inner and outer surfaces } wherein
said heating element is configured to maintain said inner surface at a temperature of
at least 3000°F. }

38. (New) The quench gasifier according to claim 37 wherein the feedstocks include metal compounds such as vanadium trioxide, and wherein the feedstocks are substantially free of solidified metal compounds.

39. (New) The quench gasifier according to claim 37 wherein said heated inner surface causes the partially oxidized carbon in the feedstocks to increase in the range of 0.1 to 3.0 percent.

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40. (New) The quench gasifier according to claim 37 wherein said heated inner surface causes a steam consumption rate in the range of 0.15 to 0.25 pounds of steam per pound of feedstocks.